SAN JUAN WATER DISTRICT

2005 URBAN WATER MANAGEMENT PLAN

December 2005

Prepared by:

BROWN AND CALDWELL
10540 White Rock Road, Suite 180
Rancho Cordova, California 95670
(916) 444-0123

10540 White Rock Road, Suite 180
Sacramento, California 95670

Tel: (916) 444-0123
Fax: (916) 635-8805

www.brownandcaldwell.com

BROWN AND CALDWELL

December 21, 2005

Lisa Amaral
San Juan Water District
9935 Auburn Folsom Road
Granite Bay, California 95746

017-128667-001

Subject: Submittal of 2005 Urban Water Management Plan

Dear Ms. Amaral:

I am pleased to submit to you this 2005 Urban Water Management Plan (Plan). This Plan is written according to the requirements of the Urban Water Management Planning Act and the guidelines as provided by the California Department of Water Resources.

If you have any questions, please do not hesitate to contact me at (916) 853-5332.

Sincerely,

BROWN AND CALDWELL

Jim Crowley, P.E.
Project Manager

Enclosures
JC:ds

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

APPENDICES

LIST OF TABLES

TABLE OF CONTENTS (continued)

LIST OF FIGURES

CHAPTER 1
INTRODUCTION

This Urban Water Management Plan (Plan) addresses the San Juan Water District (District), which was formed on February 10, 1954. This 2005 Urban Water Management Plan is required by the Urban Water Management Planning Act (Act) (California Water Code Division 6, Part 2.6, Sections 10610 through 10657).

The remainder of this chapter provides an overview of the plan, public participation, and agency coordination.

1.1 Urban Water Management Planning Act

One of the purposes of this Plan is to ensure the efficient use of available water supplies, as required by the Act. The Act became part of the California Water Code with the passage of Assembly Bill 797 during the 1983–1984 regular session of the California legislature. Subsequently, assembly bills between 1990 and 2003 amended the Act. Most recently the Act was amended on January 1, 2003 by Assembly Bill 105.

The Act requires every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet (ac-ft) of water annually to adopt and submit an urban water management plan every five years to the California Department of Water Resources (DWR). According to DWR, the Act states that these urban water suppliers should make every effort to assure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years. The Act describes the contents of the Plan as well as how urban water suppliers should adopt and implement the Plan. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

The Plan describes the availability of water and discusses water use, reclamation, and water conservation activities. The Plan concludes that the water supplies available to the District's customers are adequate over the next 20-year planning period.

1.2 Public Participation

The Act requires the encouragement of public participation and a public hearing as part of the Urban Water Management Plan approval process. As required by the Act, prior to adopting this Plan, the District made the Plan available for public inspection and held a public hearing. This hearing provided an opportunity for District's customers and all residents and employees in the service area to learn about the water supply situation and the plans for providing a reliable, safe, high-quality water supply for the future. The hearing was an opportunity for people to ask questions regarding the current situation and the viability of future plans.

A Notice of Public Hearing was published twice in the Sacramento Bee and copies of the draft Plan were made available for public inspection at the District's Administration Building and at local public libraries. A copy of the published Notice of Public Hearing is included in Appendix A. This Plan was adopted by the District's Board of Directors on December 14, 2005. A copy of the adopted resolution is provided in Appendix B. The Plan is available for public review at the District's administration building at 9935 Auburn Folsom Road, Granite Bay, California, 95746.

1.3 Agency Coordination

The Act requires the District to coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable. The District coordinated the preparation of its plan with the Sacramento Regional County Sanitation Districts (SRCSD) and its four wholesale members: Orange Vale Water Company, Fair Oaks Water District, Citrus Heights Water District, and portions of the City of Folsom. A copy of this plan was provided to the DWR, Sacramento County, Placer County, City of Folsom, and the City of Citrus Heights. Table 1-1 provides a summary of the plan coordination with the appropriate agencies.

Table 1-1. Coordination with Appropriate Agencies

	Sacramento Regional County Sanitation District	Placer County Water Agency	Citrus Heights Water District	Orange Vale Water District	Fair Oaks Water District	City of Folsom	City of Citrus Heights	Sacramento County	Placer County
Participated in developing the plan	X								
Commented on the draft					X				
Attended public meetings									
Was contacted for assistance	X								
Was sent a copy of the draft plan	X	X	X	X	X	X	X	X	X
Was sent a notice of intention to adopt	X	X	X	X	X	X	X	X	X
Not Involved / No Information									

CHAPTER 2
DESCRIPTION OF EXISTING WATER SYSTEM

This chapter describes the District's system. It contains a description of the service area and its climate, and the water supply facilities, including the groundwater wells, surface water supply facilities, booster pumping stations, reservoirs, and the piping system.

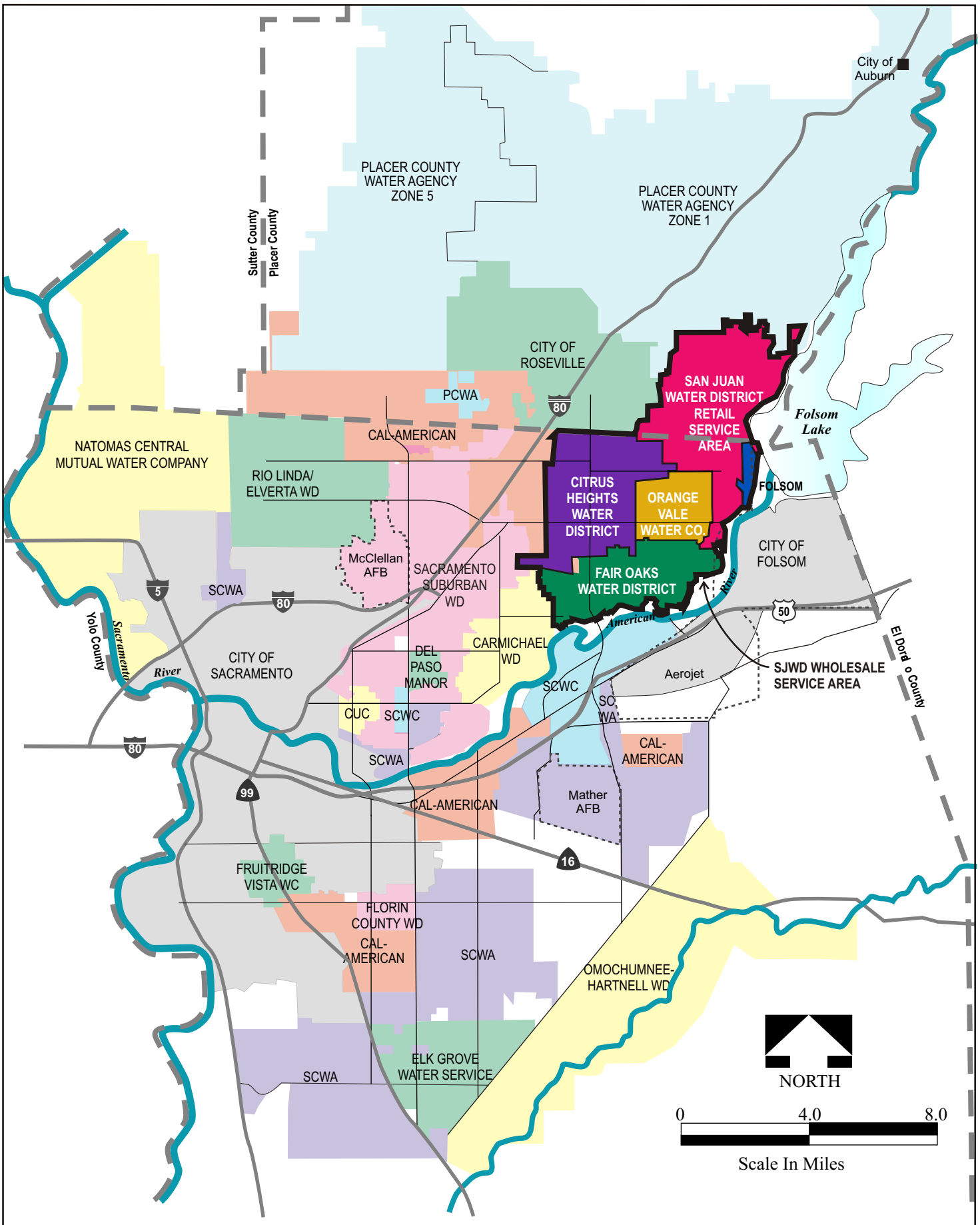
2.1 Description of Service Area

The District is both a wholesale and retail agency. The retail portion serves water to retail customers in the District's retail service area. The wholesale portion is comprised of a group of retail water agencies and is known as the San Juan Family (Family). Family agencies are the Citrus Heights Water District, Fair Oaks Water District, Orange Vale Water District, San Juan Water District retail service areas, and the City of Folsom. Only a portion of the City of Folsom, the Ashland area, is served wholesale water by San Juan Water District. Figure 2-1 illustrates the location of the District's service area and the neighboring water systems. The Family agency service areas are shown on Figure 2-2.

The District supplies treated surface water to the wholesale customers. Three of the Family agencies, Citrus Heights Water District, Fair Oaks Water District, and Orange Vale Water District supplement their surface water supply from San Juan Water District with their own groundwater wells. This Plan provides detailed customer information for the District's retail customers, and provides summary information for its Wholesale customers as it pertains to supply and demand requirements for the future.

2.2 Climate

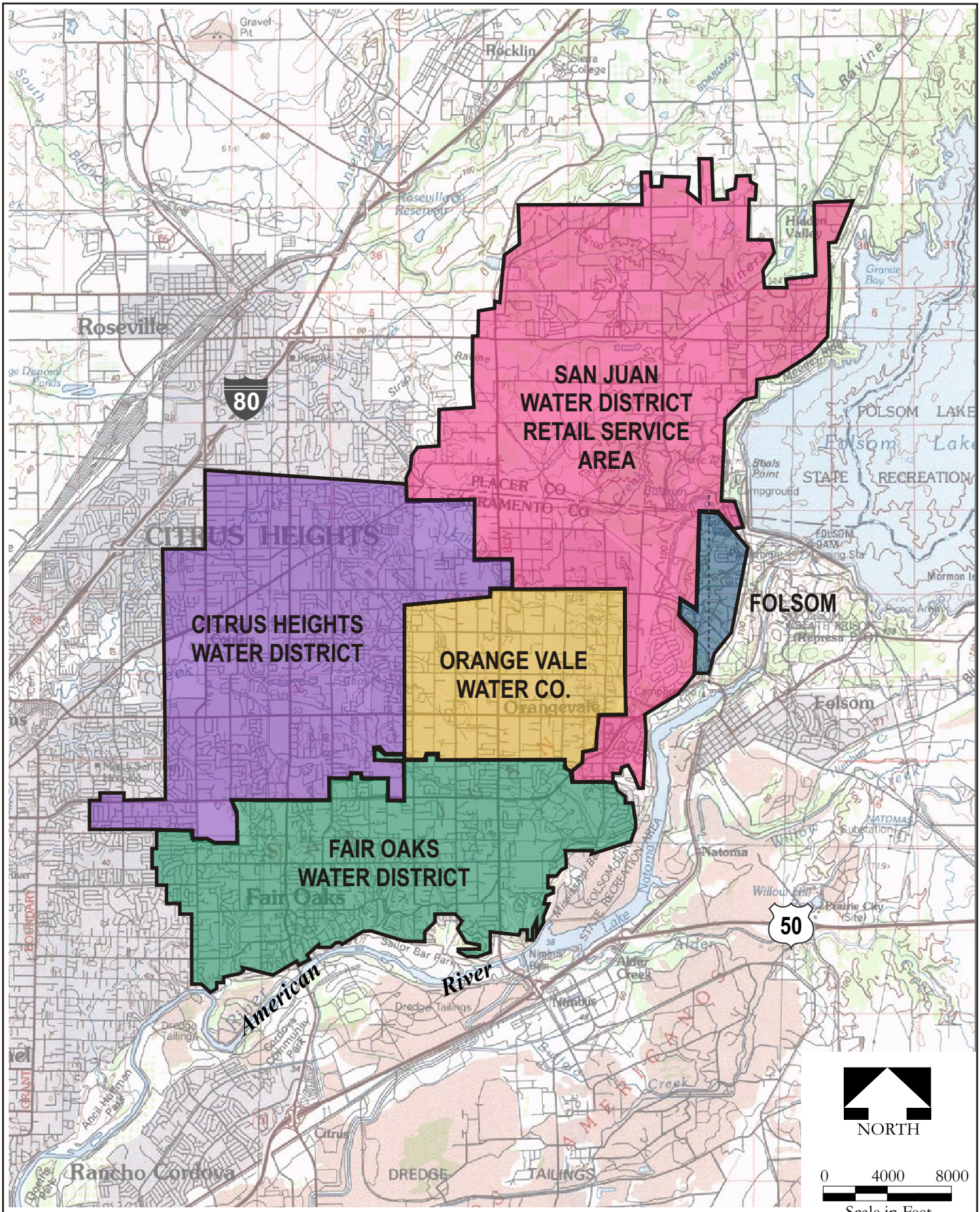
The service area experiences cool and humid winters and hot and dry summers. The District's weather is similar to the City of Sacramento because of the proximity of the District to the City of Sacramento. Based on the historical data obtained from the Western Regional Climate Center, Sacramento's average monthly temperature ranges from 38 to 93 Fahrenheit (°F); but, the extreme low and high daily temperatures have been 18 and 115 °F , respectively. Data is shown in Table 2-1. The historical annual average precipitation is approximately 17 inches. The rainy season begins in November and ends in March. Average monthly precipitation during the winter months is about 2 to 3 inches, but records show that monthly precipitation has been as high as 10 inches and as low as 0 inches. Relative humidity in the region ranges from 29 percent to 90 percent. Low humidity usually occurs in the summer months, from May through September. The combination of hot and dry weather results in high water demands during the summer.



BROWN AND CALDWELL

PROJECT	2005 Urban Water Management Plan San Juan Water District	Figure
128667		2-1
DATE 11-10-05	San Juan Water District and Family Agencies	

P:\28000\128667 - SJWD 2005 UWMP\GRAPHICS



Source: TOPO!, National Geographic, 2001

BROWN AND CALDWELL	PROJECT 128667	2005 Urban Water Management Plan San Juan Water District	Figure **2-2**
	DATE 10-7-05	District Wholesale Service Areas	

P:\28000\128667 - SJWD 2005 UWMP\GRAPHICS

Table 2-1. Climate Data

Month	Average precipitation (in.)	Average monthly ETo	Average temperature (°F)	Maximum temperature (°F)	Minimum temperature (°F)
January	4.4	1.59	46	73	17
February	3.8	2.20	51	78	19
March	3.9	3.66	54	86	26
April	1.9	5.08	59	94	30
May	0.6	6.83	65	106	35
June	0.2	7.80	72	112	43
July	0.1	8.67	77	115	50
August	0.1	7.81	77	114	45
September	0.5	5.67	73	108	46
October	1.5	4.03	66	102	32
November	3.4	2.13	54	86	26
December	3.5	1.59	47	74	16
Annual	23.9	57.0	62	115	16

Notes:
Above data obtained from the Western Region Climate Center, Folsom Dam (043113) Year 1955 to Year 1993. ETo was obtained from the CIMIS website: http://www.cimis.water.ca.gov/cimis/welcome.jsp. ETo averages were based on the region of Fair Oaks.
in = inches
ETo = evapotranspiration

2.3 Water Supply Facilities

Water supply for the District is surface water from Folsom Lake. Water is delivered from Folsom Lake to the Sidney N. Peterson Water Treatment Plant with a capacity of 120 million gallons per day (mgd). The treated water is sent to Hinkle Reservoir, which has a capacity of 62 million gallons (MG) (190 ac-ft). The reservoir is hypalon-lined and covered. The Hinkle Reservoir provides capacity for peaking and emergencies in excess of treatment plant production.

2.4 Distribution System

This section discusses the District's distribution system, including storage, pump stations, and interconnections.

2.4.1 Facilities

The water supplied to the District's retail service area (San Juan Water District's [SJWD] Retail) and the City of Folsom is delivered by gravity and pressure distribution systems. The District's facilities deliver wholesale water by gravity to Fair Oaks Water District, Orange Vale Water Company, and Citrus Heights Water District. The District's retail delivery system is on-demand and the conveyance system includes 135 piped miles.

The outlet from Hinkle Reservoir is a short 84-inch diameter pipeline with a spur that feeds the Hinkle pump station. The pump station boosts water into an 18-inch pipeline south to the Folsom area and 14-inch pipeline north to the retail service area. A 72-inch gravity transmission pipeline continues 2,000 feet westerly from the Hinkle pump station where it divides into two 54-inch pipelines and has a spur that feeds the Bacon Pump Station. A portion of the water is boosted by the Bacon Pump Station through three pipelines to the three separate retail pressure zones in the service area. The major share of water continues by gravity through the two 54-inch pipelines to the manifold approximately 5,000 feet to the south.

The manifold receives flow from the 54-inch pipelines and discharges into four smaller transmission mains, three of which deliver the water by gravity to the SJWD Retail Area, Orange Vale Water Company, Fair Oaks Water District, and Citrus Heights Water District. Each of the three agencies has distribution facilities to deliver water to users on a retail basis. A fourth pipeline, 24-inches in diameter, diverts water from the manifold westerly 2,000 feet to the North Folsom area.

In 1998, a 72-inch transmission pipeline was installed to improve water service to the wholesale agencies of Citrus Heights Water District, Fair Oaks Water District, Orange Vale Water Company, and Northridge Water District. The Northridge Water District, now the Sacramento Suburban Water District, purchases water from PCWA that is treated and wheeled through the District's facilities. The pipeline is also used to deliver other annual purchases through the District's treatment facilities to the purchasing agency.

2.4.2 Pump Zones-Retail Service Area

The district's retail service area is separated into six, and sometimes seven, pressure zones and a gravity zone.

2.4.3 Pump Stations – Retail Service Area

There are five existing pump stations in the retail service area. The Bacon Station provides water to three pressure zones, one of which supplies the Douglas and Granite Bay Pump Stations to further lift the water to the upper and lower Granite Bay Pump Zones. Additionally, the District operates the Hinkle Station which serves the Crown Point retail service area and a portion of the city of Folsom on a wholesale basis. The American River Pump Station serves the American River Canyon South.

2.4.4 Storage Facilities – Retail Service Area

Hinkle Reservoir serves as the primary storage reservoir for the wholesale agencies, including the retail service area, with a capacity of 62 MG. The retail service area has two smaller storage facilities: Kokila Reservoir with a capacity of 4.5 MG and Los Lagos tank with a capacity of 1.6 MG.

CHAPTER 3
HISTORICAL AND PROJECTED WATER USE

Water demand projections provide the basis for sizing and staging future water facilities. Water use and production records, combined with projections of population, employment, and urban development, provide the basis for estimating future water requirements. The District is in the process of completing a Wholesale Master Plan and a Retail Master Plan, both of which analyze water use and projected demands up to 2030 and 2025, respectively. This chapter summarizes the water use and demand projections presented in both draft master plan documents.

3.1 Population and Connection Projections

The District is conducting two master plans that address the retail service area and the wholesale service area. The total population projections from these two master plans are presented in Table 3-1. The population is expected to reach 172,946 in 2025.

Table 3-1. Population Estimates

Year	San Juan Water District Retail	Citrus Heights Water District	Fair Oaks Water District	City of Folsom, Ashland Service Area	Orange Vale Water Company	Total Population
2005	29,007	66,943	40,000	5,516	17,738	159,204
2010	29,790	68,753	42,500	5,638	18,531	165,212
2015	30,572	69,200	45,000	5,638	19,161	169,571
2020	31,355	70,000	45,000	5,638	19,623	171,616
2025	32,137	70,148	45,000	5,638	19,911	172,834
2030	32,137	70,148	45,000	5,638	20,023	172,946

Note:

Source: Black and Veatch. San Juan Water District – Draft Wholesale Master Plan Phase II, Historical and Projected Demand, Level of Service. April 29, 2005.

Historical and future projected District connections by customer type for the SJWD Retail area are displayed in Table 3-2. Similar information for each of the Family Agencies is not presented here, but contained in each of their respective Urban Water Management Plan (UWMPs). Historically, there are two categories for single family connections: un-metered (flat-rate) single family and metered single family. As of 2004, all of the District's connections are metered, and as of 2005, all are on metered billing. All other connections (including commercial and multi-family residential) were already metered in the years reported in the table. The account growth rate from 2003 to 2004 is applied to the 2004 account totals to calculate the 2005 connections. The projected connections for 2010 through 2025 are based on the growth rate in total retail demand applied to the previous year number of connections. For instance, the population growth rate from 2010 to 2015 is 0.6 percent. This rate is applied to the 2010 connections to determine the 2015 connections, rounded to the nearest whole number.

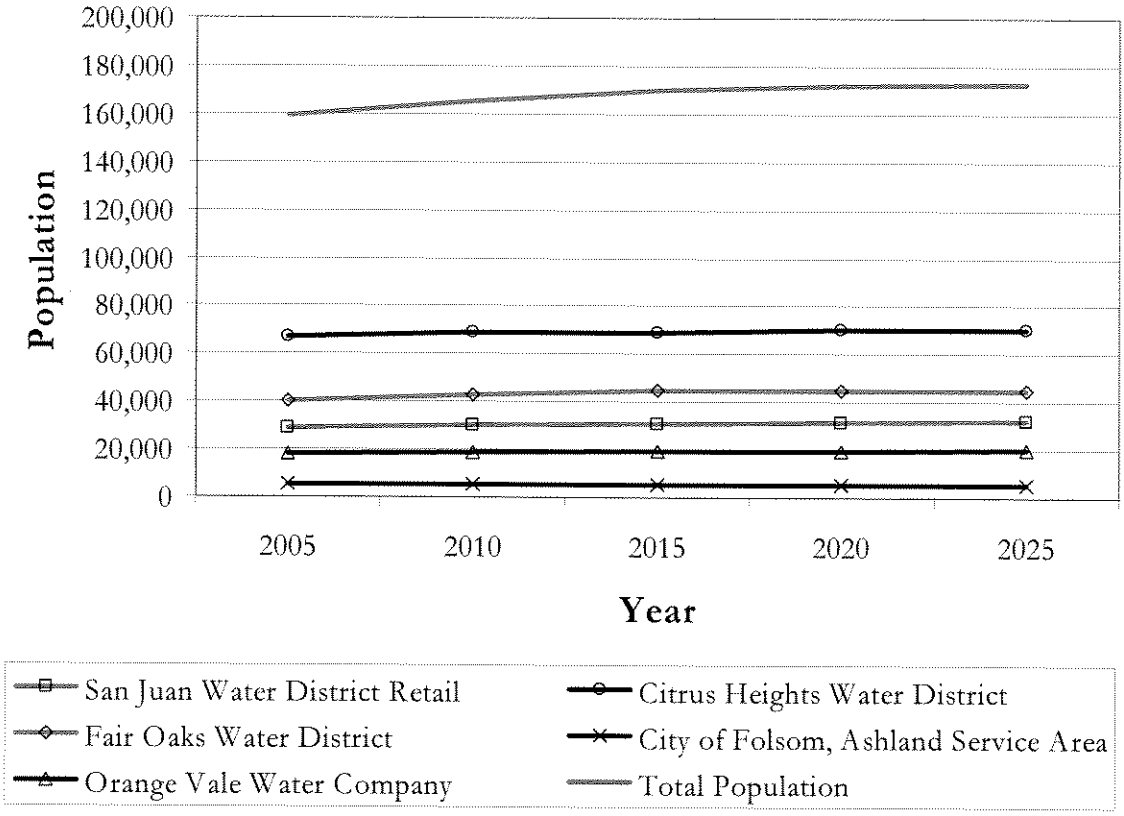


Figure 3-1. SJWD Retail and Wholesale Current and Projected Population

Table 3-2. SJWD Retail Connections by Customer Classification

Customer Classifications	Historical connections		Projected connections				
	2000[a]	2004[b]	2005	2010	2015	2020	2025
Single-family							
Un-metered	7,810	5,834	--	--	--	--	--
Metered	1,292	3,854	9688	9,950	10,014	10,130	10,152
Multi-family							
Un-metered	22	4	--	--	--	--	--
Metered	43	113	117	120	121	122	123
Commercial	173	190	190	195	196	199	199
Industrial	0	0	0	-	-	-	-
Institutional	12	12	12	12	12	13	13
Landscape irrigation	191	225	225	231	233	235	236
Agricultural	0	0	0	0	0	0	0
Other	6	8	8	8	8	8	8
Total	9,549	10,240	10,240	10,516	10,585	10,707	10,730

Notes:
Multi-family, commercial, industrial, institutional, and landscape irrigation accounts are all metered.
[a] Source: San Juan Water District 2000 UWMP.
[b]Source: San Juan Water District 2004 CUWCC Annual Report..

3.2 Historical Water Use

Records of historical water production obtained from the District serve as the basis for developing unit water demands for the District. Water production is the volume of water measured at the source, which includes all water delivered to residential, commercial, and public authority customers, as well as unaccounted-for water.

3.2.1 Annual Water Production and Average Daily Demand

Table 3-3 shows San Juan Water District wholesale production for the District from 1990 to 2004. Total water production in 2004 was 56,924 ac-ft. As Table 3-3 indicates, the SJWD Retail production averages 27 percent of total District surface water production, although the last four years have trended higher than the average. This could be a result of increased rural estate development in the SJWD Retail Service area that has increased demands due to large landscape irrigation. These estate developments are expected to impact water demand in that they have a higher unit water demand factor than an average single family customer.

Table 3-4 quantifies the sales to other agencies for 2000 and 2004. Data includes sales to the Family agencies, and to Sacramento Suburban Water District, whom the District sells water to on an as-available basis.

Table 3-3. Historical Retail to Wholesale Surface Water Production Comparison

Year	SJWD Retail Area, ac-ft/yr	Wholesale, ac-ft/yr	SJWD Retail area/total production (%)
1990	13,713	54, 680	25
1991	13,916	48,638	29
1992	14,436	52,853	27
1993	12,096	49,281	25
1994	12,963	52,985	24
1995	13,525	52,551	26
1996	12,668	51,254	25
1997	14,214	55,528	26
1998	11,971	48,313	25
1999	14,182	55,787	25
2000	14,287	53,614	27
2001	16,192	57,475	28
2002	17,361	51,960	33
2003	17,102	52,353	33
2004	17,941	56,924	32

Note:
ac-ft/yr = acre feet per year

Table 3-4. Historical Water Deliveries

Year	San Juan Water District, Retail	Citrus Heights Water District, ac-ft/yr	Orange Vale Water Company, ac-ft/yr	Fair Oaks Water District, ac-ft/yr	City of Folsom, ac-ft/yr	Sacramento Suburban Water District, ac-ft/yr	Total, ac-ft/yr
2000	14,286	19,564	4,422	14,018	1,324	15,140	68,754
2001	16,192	20,865	4,467	14,813	1,138	16,381	73,856
2002	17,361	17,618	4,377	11,456	1,149	18,039	70,000
2003	17,101	17,996	3,816	12,333	1,107	20,694	73,047
2004	17,941	19,775	4,165	13,629	1,415	18,008	74,934

Note:
Delivery volumes do not always match production volumes due to meter accuracy variances.
ac-ft/yr = acre feet per year
Source: Black and Veatch. San Juan Water District – Draft Wholesale Master Plan Phase II, Historical and Projected Demand, Level of Service. April 29, 2005.

Past and current water use by customer sector for the SJWD Retail area is provided in Table 3-5. Additional water uses and losses are also shown. Similar information for the District's Family agencies are provided in each agency's respective UWMP.

Table 3-5. District Retail Service Area Past and Current Water Use by Customer Category and Additional Water Uses and Losses, ac-ft/yr

Water use category	2000	2004
Single-family		
Un-metered	10,627	11,941
Metered	877	2,647
Multi-family	215	237
Commercial	417	393
Industrial	0	0
Institutional	228	250
Landscape irrigation	778	1,036
Saline barriers	0	0
Groundwater recharge	0	0
Conjunctive use	0	0
Raw water	0	0
Recycled	0	0
Unaccounted-for water	1,143	1,435
Total	14,285	17,940

Note:
Single-family unmetered customers, some multi-family, and unaccounted-for water categories are un-metered. Data from respective CUWCC annual reports.

3.2.2 Unaccounted-for Water

Unaccounted-for water use is un-metered water use; such as, for fire protection and training, system and street flushing, sewer cleaning, construction, system leaks, and unauthorized connections. Unaccounted-for water can also result from meter inaccuracies. Based on past District records, the unaccounted-for water for the Retail area has averaged eight percent of total water produced. As full metering is relatively new to the District (since 2004 for all of its customers), the District will continue to monitor and update the factor as more metering data is available. The current unaccounted-for water demands are incorporated into the normalization factor as discussed below.

3.3 Unit Water Use

The Retail Master Plan analyzed District account records to develop unit water demand projections for each of the District's land use designations. Resulting unit water demands are listed in Table 3-6. Factors include a normalization factor of 1.25 as developed in the draft Retail Water Master Plan. This factor scales up the unit water demands for account for high demands during a dry year period. The normalization factor also includes unaccounted-for water as the factor was based on production records.

Table 3-6. SJWD Retail Area Unit Water Use Factors

Customer classification	Unit water use factor, ac-ft/ac/yr
Rural estate	2.1
Low density residential	3.4
Medium density residential	3.8
High density residential	5.0
Business park	1.8
Commercial	3.0
Institutional	1.7
Park and Recreation	2.4
Golf Course	0.9
Agricultural	2.0
Median	0.5
Wetlands	0.0
Opens Space/Streets	0.0

Notes:
Factors include unaccounted-for water.
ac-ft/ac/yr = acre feet per acre per year

3.4 Projected Water Demands By Water Year Type

This section presents the projected water demands for three water year scenarios: normal-year, single dry year, and multiple dry years. The demands for all water year scenarios are projected through 2025.

3.4.1 Projected Normal Year Water Demands

Normal-year water demands through the year 2025 are provided in the draft Retail Master Plan based on unit water use factors and the development projections. The projected water demands from the Retail Master Plan are converted to the customer categories required for the UWMP. Results are shown in Table 3-7 and illustrated on Figure 3-2 with the overall wholesale demand projections. Each customer category demand from the draft Retail Master Plan is reduced by eight percent to remove the unaccounted-for water portion of the demand. This is done to allow the unaccounted-for water demand to be reported separately, as required for the Plan. Impacts to water use due to any conservation measures implemented in the future are not reflected in the projected water demands. Similar projected customer account information for the District's Family agencies are provided in each agency's respective Plan.

In summary, annual average total retail and wholesale demands are expected to increase at an approximate rate of 5.2 percent and 5.6 percent, respectively, per year from 2004 to 2025. As indicated on Figure 3-2, the growth is projected to flatten out, which is considered normal for an area as it reaches build-out conditions.

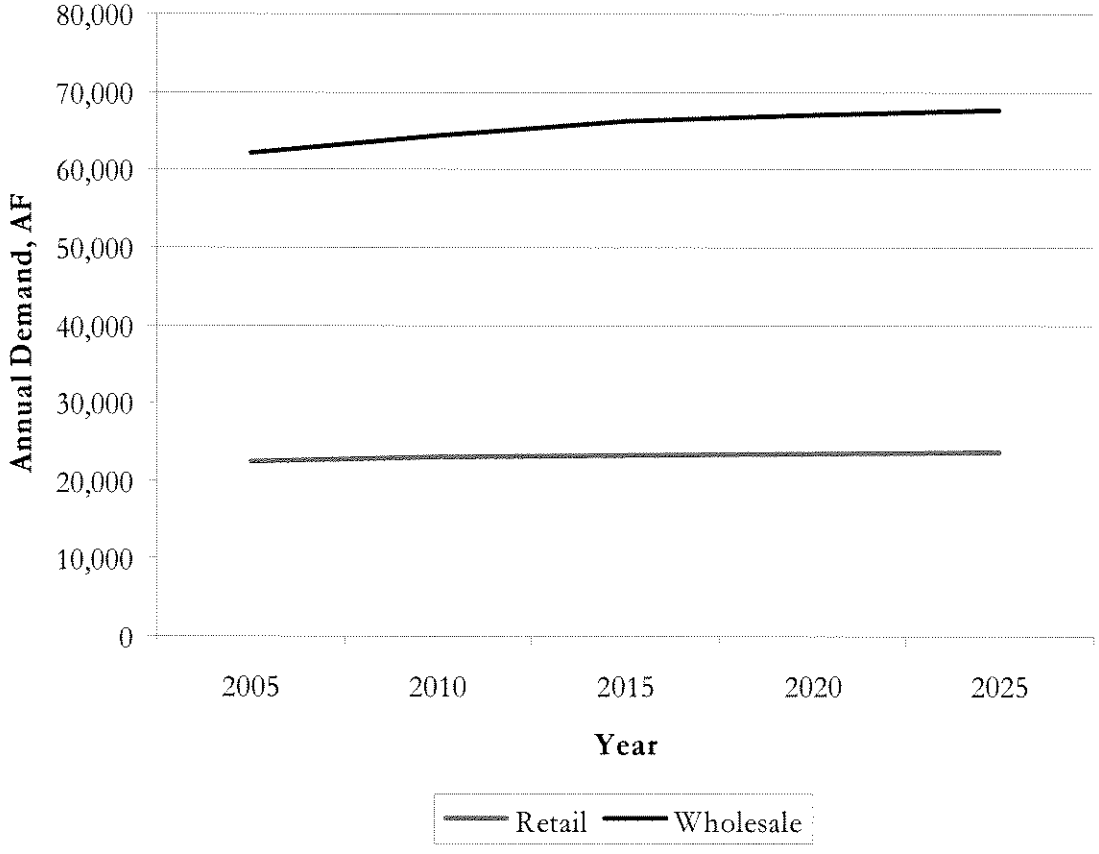


Figure 3-2. SJWD Retail and Wholesale Projected Water Demand

Table 3-7. SJWD Retail Projected Normal Year Water Demands by Customer Category and Additional Water Uses and Losses, ac-ft/yr

Water use category	2005	2010	2015	2020	2025
Single-family	15,452	16,599	17,058	17,518	17,978
Multi family	248	258	259	261	262
Commercial	764	856	893	931	969
Industrial	-	-	-	-	-
Institutional	337	342	343	344	346
Landscape irrigation	422	526	556	586	616
Saline barriers	18	21	26	30	35
Groundwater recharge	-	-	-	-	-
Conjunctive use	-	-	-	-	-
Raw water	-	-	-	-	-
Recycled	-	-	-	-	-
Unaccounted-for water[a]	1,499	1,617	1,664	1,711	1,757
Total annual average	18,741	20,218	20,800	21,381	21,963
Percent of year 2005	100%	108%	111%	114%	117%

Notes:
Data from Table 5-10 of the draft Retail Master Plan, demands from customer categories converted to UWMP customer categories. Water savings from future water conservation is not included in demand projections.
[a]Unaccounted-for water assumed to be 8 percent of total water production.

Total projected normal year water demands presented in this plan are compared in Table 3-8 with demands projected in the previous Plan and the Regional Water Master Plan for each respective end date. The demand projections have been slightly decreased than those presented in the 2000 UWMP, but are still within the range projected in the Regional Water Master Plan.

Table 3-8. Comparison of Projected District Retail Demands, ac-ft/yr

Year	2000 Plan	This Plan	Regional Water Master Plan[a]
2025	24,173	--	--
2025	--	21,963	--
2030	--	--	22,223-25,191

Notes:
[a]Montgomery Watson, 2003 American River Basin Cooperating Agencies, Regional Water Master Plan. Range reflects estimate of demand reduction implementation.

3.4.2 Projected Single Dry Year Water Demands

Water use patterns change during dry years. During dry years some water agencies cannot provide their customers with 100 percent of what they deliver during normal-water years. One way to analyze the change in demand is to document expected changes to water demand by sector. Expected changes in demand may include assuming increasing demands due to increased irrigation needs and demand reductions resulting from rationing programs and policies. It is assumed that overall demands will not change during a single-dry year due to the balancing of increased irrigation demands with reductions from demand reduction programs. Also, the unit water demands used for demand projections were normalized up to a maximum year demand, so that the projections factor in dry year demand characteristics. This is the same assumption made for the Regional Water Master Plan (Montgomery

Watson, 2003). Any demand reductions due to the implementation of the District's water shortage contingency plan are not included in the single-dry year demand estimates. Table 3-9 provides an estimate of the projected single-dry year water demands. Demands for each year are interpolated from the demand projections presented in the Wholesale Master Plan based on a straight line method. All demand projections include unaccounted-for water.

Table 3-9. Retail and Wholesale Projected Single Dry Year Water Demands, ac-ft/yr

	2005	2010	2015	2020	2025
Retail demand	18,741	20,218	20,800	21,381	21,963
Wholesale demand	62,166	64,446	66,190	67,093	67,728
Percent of projected normal[a]	100%	100%	100%	100%	100%

Notes:
Water savings from future water conservation is not included in demand projections.
[a]Projected normal from Table 3-7.

3.4.3 Projected Multiple Dry Year Water Demands

This section projects the impact of a multiple-dry year period for each five-year period during the 20-year projection. Similar to the single-dry year demand estimates, it is assumed that overall demands will not change during a multiple dry year. Any demand reductions due to the implementation of the District's water shortage contingency plan are not included in the multiple dry year demand estimates. This is the same assumption made in the Regional Water Master Plan. Tables 3-10 through 3-13 provide an estimate of the projected multiple-dry year retail and wholesale water demands for each five-year period.

Table 3-10. Projected Multiple Dry Year Water Demands, ac-ft/yr, Period Ending in 2010

	2006	2007	2008	2009	2010
Retail demand	19,082	19,422	19,762	20,102	20,218
Wholesale demand	62,622	63,078	63,535	63,991	64,447
Percent of projected normal[a]	100%	100%	100%	100%	100%

Notes:
Water savings from future water conservation is not included in demand projections.
[a]Projected normal from Table 3-9.

Table 3-11. Projected Multiple Dry Year Water Demands, ac-ft/yr, Period Ending in 2015

	2011	2012	2013	2014	2015
Retail demand	20,335	20,451	20,567	20,684	20,800
Wholesale demand	64,796	65,144	65,493	65,841	66,190
Percent of projected normal[a]	100%	100%	100%	100%	100%

Notes:
Water savings from future water conservation is not included in demand projections.
[a]Projected normal from Table 3-8.

Table 3-12. Projected Multiple Dry Year Water Demands, ac-ft/yr, Period Ending in 2020

	2016	2017	2018	2019	2020
Retail demand	20,916	21,033	21,149	21,265	21,381
Wholesale demand	66,371	66,551	66,732	66,912	67,093
Percent of projected normal[a]	100%	100%	100%	100%	100%

Notes:
Water savings from future water conservation is not included in demand projections.
[a]Projected normal from Table 3-8.

Table 3-13. Projected Multiple Dry Year Water Demands, ac-ft/yr, Period Ending in 2025

	2021	2022	2023	2024	2025
Retail demand	21,498	21,614	21,730	21,847	21,963
Wholesale demand	67,220	67,347	67,474	67,601	67,728
Percent of projected normal[a]	100%	100%	100%	100%	100%

Notes:
Water savings from future water conservation is not included in demand projections.
[a]Projected normal from Table 3-8.

CHAPTER 4
WATER SUPPLIES

The SJWD Retail service area and the City of Folsom north of the American River do not have groundwater supplies, and rely solely on surface water. The remaining wholesale customers use both surface water from the District and groundwater from their respective well systems as their supply sources. This section describes the surface and groundwater sources, quantities, supply constraints, and the water quality of the water supply sources. In addition, this section describes current and projected water supplies, and water supply reliability and vulnerability. Recycled water is discussed in Chapter 5 of this Plan.

4.1 Surface Water

This section provides a description of the District's surface water supply as well as the physical and legal constraints of this supply. Currently, the District receives surface water from Folsom Lake.

4.1.1 Description

The District's annual water supply of 82,200 ac-ft is comprised entirely of surface water diverted from Folsom Lake. The surface supply is summarized in Table 4-1.

As part of the purchase of the North Fork Ditch Company, the District acquired 33,000 ac-ft of pre-1914 rights water. The District also negotiated with the United States Bureau of Reclamation (USBR) for an additional 40,000 ac-ft of contract water to provide for immediate and future needs.

In the late 1960's, the USBR worked out a mathematical formula for the District's future needs and reduced the contract amount from 40,000 ac-ft to 11,200 ac-ft/yr. Immediately following the cutback, the District Board of Directors pursued the USBR to reinstate the original 40,000 ac-ft/yr. The District currently has not had the original 40,000 ac-ft/yr reinstated.

The District has entered into an additional contract with the USBR for 13,000 ac-ft/yr. This contract was initiated under PL 101-514, which is also referred to as "Fazio Water" after Congressman Vic Fazio.

In 1972, the District Board of Directors successfully negotiated a contract with Placer County Water Agency (PCWA) for additional water supply. This contract extends through 2021 and is renewable in 20-year periods. It provides for water to be supplied to the District in increasing amounts from 5,000 ac-ft beginning in 1977 to 25,000 ac-ft in the year 1992 and every year thereafter. The PCWA contract places a first priority on use in Placer County, but allows use of any water not needed in Placer County to be used in Sacramento County. The District has an agreement with the City of Roseville to sell up to 4,000 ac-ft of this water during normal years if Roseville needs it.

The District does purchase Section 215 water from the USBR when available. Section 215 water is water the USBR releases from Folsom Lake that is in excess of the entitlements and rights of downstream users, and is usually only available during winter months.

Table 4-1. SJWD Surface Water Supplies

Source	Contract Number	Amount (ac-ft)
USBR – Central Valley Project, Folsom Lake	14-06-200-1521	11,200[a]
USBR – Central Valley Project, Folsom Lake (Fazio Water)	6-07-20-W1373	13,000
Pre-1914 Right	DA-04-167-E610	33,000
PCWA	6-07-20-W1315	25,000
Total		82,200

Notes:
[a] Original USBR contract amount for 40,000 AF, but USBR reduced to 11,200.
ac-ft = acre feet

4.1.2 Physical Constraints

There are no physical constraints on the current surface water supplies that limit the ability to meet current demands. The capacities of the Folsom Dam diversion, Peterson Water Treatment Plant, and wholesale distribution systems are sufficient to divert, treat, and convey the current surface water entitlements if improvements are implemented at the Peterson Water Treatment Plant.

4.1.3 Legal Constraints

The only legal constraints on the current surface water entitlements are contract stipulations. The Water Forum does include limitations to surface water use in dry years, but is not legally binding.

Contract stipulations are placed on each of the four contracts. The two USBR Central Valley Project (CVP) contracts are subject to 25 percent reductions during drought as determined by the USBR. The 13,000 ac-ft/yr "Fazio Water" contract is also constrained to provide water only to the Sacramento County portion of the District's retail service area. The pre-1914 water right of 33,000 ac-ft/yr is constrained to provide water only to the District's wholesale service area. The PCWA contract is constrained to provide water to the Placer County portion of the District's wholesale service area first, with any excess available for Sacramento County.

The Water Forum Agreement was developed in an attempt to preserve the fishery, wildlife, recreational, and aesthetic values of the lower American River and in an effort to provide a reliable and safe water supply for the region. The District is a member of the Water Forum and a signatory of the Water Forum Agreement.

The Water Forum Agreement diversion restrictions are dependant upon the March through November projected flow into the Folsom Reservoir. When the projected March through November unimpaired

inflow into Folsom Reservoir is greater than 950,000 ac-ft/yr, the District can divert its full 82,200 ac-ft/yr. Years during which the March through November unimpaired inflow into the Folsom Reservoir is between 950,000 ac-ft/yr and 400,000 ac-ft/yr are considered to be drier years by the Water Forum. During drier years, the District must decrease diversion amounts from 82,200 ac-ft/yr down to 54,200 ac-ft/yr in proportion of the decreasing unimpaired inflow to Folsom Reservoir. Driest years (also known as Conference Years) are defined as years when projected March through November unimpaired inflow into Folsom Reservoir is less than 400,000 ac-ft/yr. During driest years, the Water Forum signatories have agreed to meet and confer to develop a plan for water use.

4.2 Groundwater

The District does not have access to groundwater in its retail service area. Three of the District's wholesale customers (Fair Oaks Water District, Orange Vale Mutual Water Company, and Citrus Heights Water District) currently use groundwater to supplement surface water from the District. This section provides a description of the groundwater supply as well as the physical and legal constraints of this supply as it pertains to the respective retail agency's dependence on the District's surface supply. Each wholesale customer is completing an UWMP that will provide more in-depth discussion of each agency's groundwater supplies and operations independent of this document.

4.2.1 Description

The groundwater basin underlying the District is located in the North American Sub-basin, which is part of the larger Sacramento Valley Groundwater Basin. According to California's Groundwater Resources Bulletin 118 (DWR, 2001), the North American Sub-basin Basin Number is 5-21.64. The Sacramento Valley Groundwater Basin is not adjudicated.

The water-bearing deposits underlying the District and its Family agencies include the Fair Oaks and Mehrten Formations. The Mehrten Formation is the most productive fresh water-bearing unit in the eastern Sacramento Valley, though some of the permeable layers of the Fair Oaks Formation produce moderate amounts of water. The February 27, 2004 draft version of Bulletin 118's groundwater basin description of the North American sub-basin identifies the sub-basin as being in overdraft.

The Sacramento Groundwater Authority (SGA) adopted its groundwater management plan in December 2003. The District is a participating agency in SGA. The authority to prepare a plan is granted to SGA through the Joint Powers Agreement (JPA) executed between the County of Sacramento and the cities of Citrus Heights, Folsom, and the City of Sacramento. The plan was prepared in compliance with Water Code Section 10753.7 resulting from the passage of SB 1938 in 2002. A copy of the table of contents, resolution, and CD from this plan is provided in Appendix E.

The plan establishes a goal, management objectives, and the primary components needed to manage the basin including a plan to eliminate overdraft. These components include:

- Stakeholder Involvement
- Monitoring Program
- Groundwater Resource Protection
- Groundwater Replenishment
- Planning Integration

The estimated average annual sustainable yield recommendation for the North sub-area of the County of Sacramento, as defined by the Water Forum, is 131,000 ac-ft/yr (EDAW/SWRI, October 1999). SGA is in the process of evaluating the groundwater basin and identifying any required management. The allocation of groundwater in the region has not been completed. For this report, it is assumed that each San Juan Family member's groundwater supply is adequate to meet the needs of dry year or emergency demands.

Groundwater elevation levels have been generally declining in Sacramento County for the last 40 years, ending in 1996. Since 1996, increased conjunctive use efforts in the Sacramento area have slowed or eliminated the groundwater elevation decrease, with some wells even showing an increase in water levels. (SGA Groundwater Management Plan, 2003). Generally, the wells located further west from the San Juan Family service area have demonstrated greater water level decreases. Wells located within the San Juan Family service area have generally demonstrated small changes in water levels throughout the last 50 years, with some wells showing increased water levels in the last 10 years.

The District recently completed an analysis of the San Juan Family's projected water demands and level of service (Black and Veatch, 2005). In the analysis, each Family agency requested a level of service from the District for surface water. Results indicate 100 percent surface water supply is expected for San Juan Water District Retail, Orange Vale Water Company, and Folsom. Ninety-five percent surface water supply is expected for Citrus Heights Water District, and 70 percent surface water supply is expected for Fair Oaks Water District. Citrus Heights Water District and Orange Vale Water Company intend to supplement their surface water supply with groundwater during drier years that trigger supply reductions, and for peak flow conditions. These expected levels of service demands are included in the demand projections in Chapter 3, and in the various other tables in this report that include descriptions of supplies and demands.

4.2.2 Physical Constraints

The physical constraints on the current groundwater supply are the pumping capacities of existing wells. As wells are owned and operated by the Family agencies, and not the District, capacities and/or constraints are included in each respective agency's Plan. The District has not evaluated the Family agency's groundwater delivery systems for constraints.

4.2.3 Legal Constraints

There are no legal constraints that limit groundwater pumping. The SGA, formerly the Sacramento North Area Groundwater Management Authority, was formed in 1999 to manage the groundwater basin north of the American River. SGA's goal is to protect the health of the groundwater basin within Sacramento County north of the American River. The SGA JPA has been delegated the powers necessary to protect and regulate the local groundwater basin to the overlying water purveyors. One objective of SGA is to maintain the long-term sustainable yield of the groundwater basin north of the American River through conjunctive use practices. Pumping fees imposed by SGA will most likely be used as a mechanism to limit groundwater pumping. SGA's goal is to limit the long-term average Sacramento area groundwater pumping to approximately 131,000 ac-ft/yr, which was approximately the amount of groundwater pumped within the SGA boundaries in 1990. Any fees or other mechanisms to limit or control groundwater pumping would directly affect the Family agencies that rely on groundwater, specifically, during drought and emergency conditions. It is anticipated that the projected groundwater supply needs for these two agencies will not be limited.

4.3 Desalination

As shown in Table 4-2, there are no opportunities for the development of desalinated water within the District's service area as a future supply source.

Table 4-2. Opportunities for Desalinated Water

Sources of water	Opportunities
Ocean water	none
Brackish ocean water	none
Brackish groundwater	none

4.4 Water Quality

This section describes the water quality of the existing water supply sources within the District and the manner in which water quality affects water management strategies. In addition, this section describes the manner in which water quality affects the water supply.

The quality of existing surface water and groundwater supply sources over the next 20 years is expected to be adequate. Surface water will continue to be treated to drinking water standards, and no water quality deficiencies are foreseen to occur in the next 20 years. There are no expected significant changes in the water quality of the Family agency's groundwater sources over the next 20 years. A portion of the Fair Oaks Water District's (FOWD) groundwater wells have been contaminated by the Aerojet groundwater contamination plume. This is an existing condition and FOWD is working on a response and remedy with Aerojet. It is not anticipated that additional wells in the FOWD will be contaminated as the plume is generally traveling in west-northwest direction, away from the other FOWD wells. Additional information on the impact to FOWD operations and planning should be provided in their UWMP.

All groundwater supplies in the Family agencies' service areas meet or exceed all current drinking water standards, including secondary standards regulated for aesthetic qualities. Iron and manganese are two metals that occur naturally within the geological formations from which the groundwater is extracted, and are known to be at elevated levels in wells of surrounding water systems.

Water quality effects the District's water management strategies through the District's efforts to be in compliance with Federal and State regulations. These regulations require rigorous water quality testing, source assessments, and treatment compliance. No other special water management strategies due to water quality effects are necessary.

A summary of the current and projected water supply changes due to water quality is provided in Table 4-3.

Table 4-3. Current and Projected Water Supply Changes Due to Water Quality, percent

Water supply sources	2005	2010	2015	2020	2025
Surface Water – Lake Folsom	0	0	0	0	0
Family produced groundwater	0	0	0	0	0
Recycled water	0	0	0	0	0
Desalination water	0	0	0	0	0

4.5 Current and Projected Normal Year Water Supplies

Table 4-4 presents the projected normal year supply for the District's retail service area. The groundwater supply is assumed zero as the District retail service area does not use any groundwater. Some of the Family agencies do use groundwater, and their projected supplies are included in each Agency's respective Plans. The recycled water supply is described in Chapter 5. Water supply loss due to water quality is not anticipated.

Table 4-4. Projected Normal Year Water Supplies, ac-ft/yr

Water supply sources	2005	2010	2015	2020	2025
Surface Water					
USBR CVP	11,200	11,200	11,200	11,200	11,200
USBR CVP (Fazio Water)	13,000	13,000	13,000	13,000	13,000
PCWA	25,000	25,000	25,000	25,000	25,000
Pre-1914 Right	33,000	33,000	33,000	33,000	33,000
Supplier produced groundwater[a]	0	0	0	0	0
Recycled water[b]	0	0	0	0	0
Water supply loss due to water quality	(0)	(0)	(0)	(0)	(0)
Desalination water	0	0	0	0	0
Total	82,200	82,200	82,200	82,200	82,200

Notes
[a]SJWD does not supply groundwater, but some of its Family Agencies use their own groundwater.
[b]Recycled water is discussed in Chapter 5 of this Plan.

4.6 Water Supply Reliability

This section describes the reliability of the water supply and vulnerability to seasonal or climatic shortage. A water supply reliability comparison is made in Table 4-5 for the year 2025, considering three water supply scenarios: average/normal-water year; single-dry water year; and multiple-dry water years. Restrictions listed in the table are due to contract and Water Forum restrictions. The contract restrictions on both CVP water contracts are enforced by the USBR during drought years. It is assumed that the CVP water will be reduced to its contracted stipulated amount of 75 percent of contract for each water supply scenario.

Table 4-5. Water Supply Reliability, 2025, ac-ft/yr

Water supply sources	Normal water year	Single dry water year[a]	Multiple dry water years			
			Year 1	Year 2	Year 3	Year 4
Surface Water						
USBR CVP	11,200	8,400	8,400	8,400	8,400	8,400
USBR CVP (Fazio Water)	13,000	9,750	9,750	9,750	9,750	9,750
PCWA	25,000	25,000	25,000	25,000	25,000	25,000
Pre-1914 Right	33,000	33,000	33,000	33,000	33,000	33,000
Supplier produced groundwater (SJWD-retail)	0	0	0	0	0	0
Family member groundwater[b]	0	0 – 13,528	0 – 13,528	0 – 13,528	0 – 13,528	0 – 13,528
Recycled water[c]	0	0	0	0	0	0
Water supply loss due to water quality	(0)	(0)	(0)	(0)	(0)	(0)
Desalination water	0	0	0	0	0	0
Total Supply	82,200	67,728	67,728	67,728	67,728	67,728
Water Forum Restrictions[d]	none	54,200-82,200	54,200-82,200	54,200-82,200	54,200-82,200	54,200-82,200
Percent of normal year supply	100%	82%	82%	82%	82%	82%

Notes:
Units of measure : ac-ft/yr = acre feet per year
[a] Supply based on full use of CVP contracts..
[b] Groundwater supply from Family Agencies used to meet any surface water supply reductions. District is working to finalize this agreement with the Family Agencies Volume listed is in addition to normal-year groundwater use as reported in each respective family member's UWMP. Volume is calculated as amount required to meet 2025 demand of 67,728 AF with surface water constrained to Water Forum max amount of 54,200 AF.
[c] Recycled water is discussed in Chapter 5 of this Plan..
[d] Water Forum restrictions include the CVP contract restrictions

The definitions of these three water supply scenarios, as provided by DWR (DWR, 2005), are provided below. In evaluating the water supply reliability it is assumed that the single dry year and multiple dry years in this Plan have the same definition as drier and driest years in the Water Forum Agreement.

1. Normal year is a year in the historical sequence that most closely represents median runoff levels and patterns. Normal is defined as the median runoff over the previous 30 years or more. This median is recalculated every ten years.

2. Single-dry year is generally considered to be the lowest annual runoff for a watershed since the water year beginning in 1903.

3. Multiple-dry year is generally considered to be the lowest average runoff for a consecutive multiple year period (three years or more) for a watershed since 1903.

The basis of the water year data to develop the water supply reliability in Table 4-6 is provided in Table 4-6. This data is based on American River flows.

Table 4-6. Basis of Water Year Data

Water year type	Base year(s)
Single-dry water year	1976-1977
Multiple-dry water years	1987-1992

The Water Forum restrictions do not apply to specific contracts or entitlements, but are applied to the District's surface water use as a whole. Restrictions are based on the terms as described in Section 4.1.3. In summary, the District can divert between 54,200 ac-ft/yr and 82,200 ac-ft/yr of American River water in "drier" years.

Although the District retail service area does not use groundwater, some of its Family agencies do. It is planned that surface water demand will decrease during dry years and Family agencies will increase groundwater pumping to meet demand. It is assumed that groundwater quantity is generally unaffected by short-term drought conditions and is managed through coordination with SGA and the groundwater management plan. More detailed analysis of groundwater pumping during dry year conditions is included in each Family agency's respective Plan. The conjunctive use strategy is indicated in the supply and demand tables throughout this Plan.

Water quality issues are not anticipated to have significant impact on water supply reliability. At this time, it appears there are no known surface water quality issues that could impact availability or reliability. Of the Family agencies that use groundwater, it is assumed that only Fair Oaks Water District is impacted by groundwater quality issues, i.e. the Aerojet plume, at this time. The Fair Oaks Water District is implementing an alternative supply strategy and it is assumed their supply will not be further impacted by the Aerojet plume.

A summary of the factors resulting in inconsistency of the surface water and groundwater supply sources is provided in Table 4-7.

Table 4-7. Factors Resulting in Inconsistency of Supply

Water supply sources	Legal	Environmental	Water quality	Climatic
Surface water	X	X		X
Supplier produced groundwater	N/A	N/A	N/A	N/A

The District's only inconsistent source of water due to contract restrictions is the USBR CVP surface water supply. However, the Water Forum restricts allowable diversions during dry years irregardless of

contracts and rights. In dry years, when surface water availability is inconsistent, the San Juan Family plans to increase groundwater pumping to meet Family agency demands. Water demand management measures would not be solely depended upon to replace inconsistent sources. The water shortage contingency plan would be implemented when there is a need to reduce demands significantly on a short-term basis. Chapter 6 of this Plan describes the District's current demand management measures. The water shortage contingency plan is presented in Appendix D.

4.6.1 Projected Single Dry Year Water Supplies

The projected single-dry year water supplies are provided in Table 4-8. The values assume that CVP water will be reduced to 75 percent of contract value. However, the controlling cutback is dictated in the Water Forum agreement, with a maximum cutback down to 54,200 AF in all but the worst case dry years. The District assumes the dry year water supplies are based on the Water Forum restrictions of maximum allowable surface water diversions of 54,200 AF. The District assumes the remaining supply will be met by increased groundwater pumping form the Family Agencies. The District and the Family Agencies are working to finalize this agreement.

Table 4-8. Projected Single Dry Year Water Supplies, ac-ft/year

	2005	2010	2015	2020	2025
Total supply[a]	62,166	64,447	66,190	67,093	67,728
Percent of normal year supply	76%	78%	81%	82%	82%

Note:
Units of Measure: ac-ft/yr
[a] Total supply assumes District surface water is restricted to 54,200 AF by Water Forum, and that Family Agencies with groundwater supply capabilities make up the remaining supply to meet demands.

4.6.2 Projected Multiple Dry Year Water Supplies

This section projects the impact of a multiple-dry year period for each five-year period during the 20-year projection. Tables 4-9 through 4-12 provide an estimate of the projected multiple-dry year water supplies for each five-year period. The values assume that CVP water will be reduced to 75 percent of contract value, and that any cut in surface water supply will be made up by Family Agency groundwater.

Table 4-9. Projected Multiple Dry Year Water Supply, ac-ft/yr, Period Ending in 2010

	2006	2007	2008	2009	2010
Total supply[a]	62,622	63,078	63,535	63,991	64,447
Percent of normal-year supply	76%	77%	77%	78%	78%

Note:
Units of Measure: ac-ft/yr
[a] Total supply assumes District surface water is restricted to 54,200 AF by Water Forum, and that Family Agencies with groundwater supply capabilities make up the remaining supply to meet demands.

Table 4-10. Projected Multiple Dry Year Water Supply, ac-ft/yr, Period Ending in 2015

	2011	2012	2013	2014	2015
Total supply[a]	64,796	65,144	65,493	65,841	66,190
Percent of normal-year supply	79%	79%	80%	80%	81%

Note:
Units of Measure: ac-ft/yr
[a] Total supply assumes District surface water is restricted to 54,200 AF by Water Forum, and that Family Agencies with groundwater supply capabilities make up the remaining supply to meet demands.

Table 4-11. Projected Multiple Dry Year Water Supply, ac-ft/yr, Period Ending in 2020

	2016	2017	2018	2019	2020
Total supply[a]	66,371	66,551	66,732	66,912	67,093
Percent of normal-year supply	81%	81%	81%	81%	82%

Note:
Units of Measure: ac-ft/yr
[a] Total supply assumes District surface water is restricted to 54,200 AF by Water Forum, and that Family Agencies with groundwater supply capabilities make up the remaining supply to meet demands.

Table 4-12. Projected Multiple Dry Year Water Supply, ac-ft/yr, Period Ending in 2025

	2021	2022	2023	2024	2025
Total supply[a]	67,226	67,360	67,493	67,627	67,728
Percent of normal-year supply	82%	82%	82%	82%	82%

Note:
Units of Measure: ac-ft/yr
[a] Total supply assumes District surface water is restricted to 54,200 AF by Water Forum, and that Family Agencies with groundwater supply capabilities make up the remaining supply to meet demands.

4.7 Water Supply Projects

The District does not currently have any water supply projects planned for the retail area. There are projects planned for the Wholesale area, but they are for supply reliability, and not for increasing supply capabilities. Table 4-13 summarizes future water supply projects as required in the UWMP guidelines.

Table 4-13. Future Water Supply Projects

Project name	Projected start date	Projected completion date	Normal water year, ac-ft/yr	Single-dry water year, ac-ft/yr	Multiple- dry years, ac-ft/yr			
					Year 1	Year 2	Year 3	Year 4
None								

4.8 Transfer and Exchange Opportunities

Opportunities for exchanges or transfers of water on short term or long term basis consist of current and future transfer opportunities.

The District recently participated in a pilot groundwater banking and exchange program in conjunction with the Regional Water Authority (RWA). This pilot program transferred water to DWR's environmental water account on a short-term basis. It is anticipated that similar transfer opportunities will occur in the future. The District intends to work with the RWA to identify both short-term and long-term exchange and transfer opportunities with other RWA members. The regional water master plan developed by the American River Basin Cooperating Agencies (Montgomery Watson, 2003) identifies several potential projects for transferring water.

The District has an agreement with the City of Roseville to supply 4,000 ac-ft of water during normal hydrologic years. During dry years when supplies are reduced, the City of Roseville has agreed not to take this surface water. The source of the 4,000 ac-ft is the 25,000 ac-ft contract with PCWA.

A summary of the District's water supply transfer and exchange opportunities is provided in Table 4-14. The Water Code definition of short- and long-term is that short-term is for a period of one year or less and long-term is for a period of more than one year.

Table 4-14. Transfer and Exchange Opportunities

Transfer agency	Transfer or exchange	Short-term quantity, ac-ft/yr	Long term quantity, ac-ft/yr
City of Roseville – normal to wet years	transfer	0	4,000

CHAPTER 5
RECYCLED WATER

The purpose of this chapter is to provide information on recycled wastewater and its potential for use as a water resource in the District.

5.1 Recycled Water Plan Coordination

Wastewater generated in the District's service areas is collected and treated at two locations. Wastewater from the service area in Placer County is generally collected by Placer County and the City of Roseville and treated at the City of Roseville's Dry Creek Wastewater Treatment Plant (Dry Creek WWTP). Wastewater from the service area in Sacramento County is generally collected and treated by the SRCSD. The one main exception is that the City of Folsom, who is responsible for the collection system within the City prior to discharge to SRCSD's interceptor system. Most of the local water agencies are in coordination with the City of Roseville and SRCSD regarding various issues such as conservation methodologies and rebates, reuse potential, and other issues. The District has no authority or control over municipal wastewater generated in the District's area. The District also currently has no authority of reuse in its area, and there is no reuse water available in its service area. However, the local water purveyors understand reuse will become an important element of integrated water supply planning and support the development of a reuse supply component.

Both the City of Roseville and SRCSD are currently conducting reuse studies or planning efforts. The SRCSD study is a more detailed investigation of reuse potential for the region and is expected to develop a list of reuse projects to begin planning and design. The City of Roseville has completed a reuse study and is implementing infrastructure improvements to increase reuse.

Both efforts involve the coordination, updates, and input from individual local water districts, and from the regional water agencies, the RWA, and the SGA. Table 5-1 lists the agencies involved in reuse planning and each respective involvement.

Table 5-1. Agency Participation in Reuse Planning

Participating agencies	Role
Sacramento Regional County Sanitation District	As the only agency with wastewater collection and treatment authority in Sacramento County, SRCSD is conducting a reuse study to develop reuse supply and projects for implementation. SRCSD has joined the RWA and actively seeks input from the water purveyors on reuse supply and planning issues.
City of Roseville	Continually updates its reuse plans and implements infrastructure projects to increase reuse applications.
Regional Water Authority	Provides input and review of reuse planning process and recommendations. Updates SRCSD and City of Roseville on supply issues and where/how reuse could become part of supply integration.
Sacramento Groundwater Authority	Provides input and review of reuse planning process and recommendations. Updates SRCSD on supply issues and where/how reuse could become part of supply integration.
San Juan Water District and other local water agencies	Provides input to SRCSD on localized water demands and supply to highlight where reuse is most feasible. Some agencies, such as Sacramento County Water Agency, City of Sacramento, and City of Folsom, are requiring that a reuse distribution system be installed in new development areas.
Sacramento County Planning Agency	Provided land use information to SRCSD for their reuse study.
Placer County	Is actively decommissioning its smaller wastewater treatment plants, diverting flows to the City of Roseville for treatment, and participating in a regional sewer authority to provide wastewater collection and treatment and reuse opportunities with other west Placer County agencies.

5.2 Wastewater Quantity, Quality, and Current Uses

The following section describes the estimated wastewater generated in the District's service area. The wastewater is collected and conveyed out of the District's service area to either the City of Roseville wastewater treatment plant or the SRCSD's wastewater treatment plant. This section provides a description of both treatment processes and current reuse in the regional area.

5.2.1 Wastewater Generation

Municipal wastewater is generated in the District from a combination of residential and commercial sources. The quantities of wastewater generated are proportional to the population and the water use in the service area. Estimates of the wastewater flows generated within the District for the present and future conditions are presented in Table 5-2. The source of the estimates is the population projection in Chapter 3 and a per capita unit flow of 138 gallons per day (gpd) including commercial use. The per capita wastewater generation unit flow rate was obtained from the final draft of the Sacramento Regional Wastewater Treatment Plant (SRWTP) 2020 Master Plan (Carollo Engineers, 2001), and is applied to both Sacramento and Placer County customers. The projected effluent that will meet reuse

water quality in the District's service area is estimated at zero as there are no immediate plans to make reuse water available in the District's service area.

Table 5-2. Wastewater Collected and Treated, ac-ft/yr

	2000	2005	2010	2015	2020	2025
Wastewater collected in service area[a]	4,158	4,486	4,607	4,728	4,849	4,970
Quantity that meets recycled water standard	0	0	0	0	0	0

Note:
[a] Wastewater is only collected in service area, there is no treatment in the District's service area.

5.2.2 Wastewater Collection and Treatment

The wastewater generated in Sacramento County is collected by gravity in a series of main, trunk, and interceptor sewers owned and operated by SRCSD. Collected wastewater is transported to the SRWTP in Elk Grove. The regional plant serves the entire Sacramento metropolitan area including the unincorporated county area adjacent to the City of Sacramento, the City of Citrus Heights, and the City of Folsom. The treatment plant receives and treats approximately 156 mgd (2004) of dry weather flow on average. The current capacity of the plant to treat dry weather flows is approximately 181 mgd. The treatment plant produces a disinfected secondary effluent that is discharged into the Sacramento River below Freeport. The principal treatment processes are primary sedimentation, pure-oxygen activated sludge, secondary sedimentation, and chlorination/de-chlorination. Planned disposal methods and quantities are presented in Table 5-3.

The City of Roseville owns and operates two treatment plants, although all the wastewater generated within the District's service area in Placer County is treated at the Dry Creek WWTP. The Dry Creek plant has a current capacity of 18 mgd dry weather flow and produces disinfected tertiary treated water.

Table 5-3. Disposal of Wastewater, ac-ft/yr

Method of disposal	Treatment level	2005	2010	2015	2020	2025
SRCSD						
River discharge	Secondary effluent	195,000	219,600	235,300	244,300	252,100
Reuse	Title 22	1,100-1,700	1,100-1,700	1,100-1,700	1,100-1,700	1,100-1,700
City of Roseville						
Creek Discharge	Title 22	22,640	28,360	33,960	49,640	50,000
Reuse	Title 22	2,000	3,000	3,000	3,000	3,000

Note:
Source: Email communication with Kent Craney, SRCSD, September 13, 2005. Reuse volume depends on results of reuse master plan.
City of Roseville 2003 UWMP – values include both Dry Creek and Pleasant Grove WWTP effluent, 2025 value estimated.

5.2.3 Water Recycling Current Uses

Currently, there are no recycled water uses within the District. A 1994 survey of reuse potential (Nolte and Associates, Inc., 1994) evaluated the role of reclaimed water as a long term water resource. The study evaluated and identified reclaimed water markets that would be financially feasible to serve and

established a plan to implement reclaimed water use. SRCSD constructed a reclaimed water treatment facility at the regional treatment plant. The water reclamation plant is designed to treat a maximum of 5 mgd with coagulation, sand filtration, and disinfection of secondary effluent from the regional plant. SRCSD is currently serving approximately 2 mgd of reclaimed water in the Laguna Creek area, near the regional treatment plant. Uses of the recycled water include irrigation of parks, schoolyards, and streetscapes in the Laguna West and Lakeside developments, and non-potable uses at the regional plant. The reclamation plant is capable of being expanded to 10 mgd to serve additional demand for landscape irrigation for the Elliott Ranch South development and future developments in the area. The areas that are intended for use of recycled water are located near the regional plant, which is a significant distance from the District. Current recycled water uses in the District are presented in Table 5-4.

The City of Roseville's recycling program currently relies on landscape irrigation for its customers. None of its reuse customers are in the District's service area. Major customers are the Del Webb community and the Woodcreek Oaks Golf Club, with some smaller uses that include streetscape landscaping, parks, and irrigation at the Dry Creek WWTP. The City of Roseville projects that future customers will be further west of the City where new development can be equipped with dual piping to allow reuse.

Table 5-4. Existing Recycled Water Uses in the San Juan Water District Service Area

Type of use	Treatment level	2004 ac-ft
Agriculture	--	0
Landscape	--	0
Wildlife habitat	--	0
Wetlands	--	0
Industrial	--	0
Groundwater recharge	--	0
Total	--	0

5.3 Potential and Projected Use of Reclaimed Water

Currently, no recycled water is used in the District's service area. The reuse potential is being investigated in the current SRCSD reuse master plan. The City of Roseville's reuse plans have concluded that due to high retrofit costs, it does not plan on providing reuse supply to the areas east of the City, which include the District's service area. This section presents the projected potential use and methods to optimize reuse in the future.

5.3.1 Potential Use of Reclaimed Water

The current SRCSD reuse study is evaluating reuse potential in the Sacramento County based on current and predicted water supply needs for the region. The study is not yet complete, but will provide a list of potential reclaimed water demands.

The potential recycled water demand is assumed to be zero in the future pending the outcome of SRCSD's study or ongoing wastewater studies by the City of Roseville and Placer County. Table 5-5 shows the projected recycled water demand for the planning period. It is anticipated that recycled water supplied to the District will be zero through 2025.

Table 5-5. Potential Recycled Water Uses, ac-ft/yr

Type of use	Treatment level	2010	2015	2020	2025
Agriculture	--	0	0	0	0
Landscape	--	0	0	0	0
Wildlife Habitat	--	0	0	0	0
Wetlands	--	0	0	0	0
Industrial	--	0	0	0	0
Groundwater recharge	--	0	0	0	0
Total		0	0	0	0

5.3.2 Projected Future Use of Reclaimed Water

Table 5-6 presents the projected reuse water demands in the District's service area. Due to lack of current wastewater treatment facility, and expense of multi-mile pipelines to bring reuse water to the District, projected reuse is zero. The only feasible way recycled water could be available in the District would be if a satellite water recycling plant was built within or near the District's service area. This option is being investigated in the current SRCSD reuse master plan.

Table 5-6. Projected Future Use of Recycled Water

Type of use	2010	2015	2020	2025
Agriculture	0	0	0	0
Landscape	0	0	0	0
Wildlife habitat	0	0	0	0
Wetlands	0	0	0	0
Industrial	0	0	0	0
Groundwater recharge	0	0	0	0
Total	0	0	0	0

5.4 Optimizing the Use of Reclaimed Water

The District does not have the authority or control to optimize the use of reclaimed water; therefore, the District does not have an optimization Reuse Plan. The SRCSD has taken steps to promote and expand the use of reclaimed water, but these steps are focused on areas adjacent to the regional plant. The steps include the construction of a water recycling plant and the requirement for new development in the south county to install dual distribution systems. The City of Roseville does have land use authority and water authority to promote recycling use. The City of Roseville has implemented many methods and policies to encourage recycling use. However, none of these methods are applicable within the District's service area because reuse supply is not available at this time. Table 5-7 reflects

this in its summary of projected and actual use of reclaimed water. As the District does not plan to have a reuse supply, it has not implemented any methods to encourage reuse, as shown in Table 5-8.

Table 5-7. Recycled Water Uses – 2005 Projection Versus Actual

Method of disposal	2000 projection for 2005	2005 actual use
Agriculture	0	0
Landscape	0	0
Wildlife habitat	0	0
Wetlands	0	0
Industrial	0	0
Groundwater recharge	0	0
Total	0	0

Table 5-8. Methods to Encourage Recycled Water Uses

Actions	ac-ft/yr of use projected to result from this action			
	2010	2015	2020	2025
Financial incentives	0	0	0	0
Other	0	0	0	0
Total	0	0	0	0

Note:
ac-ft/yr = acre feet per year

CHAPTER 6
WATER CONSERVATION

The District is a signatory to the California Urban Water Conservation Council's Memorandum of Understanding and has submitted their demand management implementation progress to the Best Management Practices (BMP) Reporting Database. The District submits both retail and wholesale reports to cover each respective portion of their operations.

Retail BMP reports for reporting years 2001-2004 are included in Appendix F. Wholesale BMP reports for reporting years 2001-2004 are included in Appendix G. The District implements all retail and wholesale BMPs and has not requested any BMP exemptions.

By implementing all of the demand management measures, and working closely with the Family agencies implementing conjunctive use, the District is maximizing its existing supply sources to minimize the need for new sources, even during dry-year periods.

CHAPTER 7
WATER SUPPLY VERSUS DEMAND COMPARISON

This chapter provides a comparison of projected water supplies and demand and water shortage expectations. The water shortage contingency plan and its anticipated affect on water demand management is presented.

7.1 Current and Projected Water Supplies vs. Demand

This section provides a comparison of normal, single-dry, and multiple-dry water year supply and demand for the District. Water demands are addressed in Chapter 3, water supply is addressed in Chapter 4, and recycled water supply is addressed in Chapter 5 of this Plan.

7.1.1 Current and Projected Normal Year Water Supplies vs. Demand

The normal water year current and projected water supplies are compared to the current and projected demand for the District in Table 7-1. The table contains the Wholesale demands and supplies as the District manages its supply and demand jointly at the wholesale level.

Table 7-1. Normal Year Water Supply and Demand Comparison, ac-ft/yr

	2005	2010	2015	2020	2025
Supply totals	82,200	82,200	82,200	82,200	82,200
Demand totals	62,166	64,447	66,190	67,093	67,728
Difference (supply minus demand)	20,034	17,753	16,010	15,107	14,472
Difference as a percent of supply	24%	22%	19%	18%	18%
Difference as a percent of demand	32%	28%	24%	23%	21%

7.1.2 Current and Projected Single Dry Year Water Supplies vs. Demand

The current and projected water supplies are compared to the demands for a single dry year for the District in Table 7-2. It is assumed that single dry year is the same as the worst case Water Forum drier years in which the District's surface water supply is limited to 54,200 ac-ft, and that any shortfall is made up by Family Agency groundwater.

Table 7-2. Single Dry Year Water Supply and Demand Comparison, ac-ft/yr

	2005	2010	2015	2020	2025
SJWD surface supply	54,200	54,200	54,200	54,200	54,200
Family agency groundwater supply	7,966	10,247	11,990	12,893	13,528
Supply totals	62,166	64,447	66,190	67,093	67,728
Demand totals	62,166	64,447	66,190	67,093	67,728
Difference (supply minus demand)	0	0	0	0	0
Difference as a percent of supply	0	0	0	0	0
Difference as a percent of demand	0	0	0	0	0

7.1.3 Projected Multiple Dry Year Water Supplies vs. Demand

The projected water supplies are compared to the demands for multiple dry years for the District in Tables 7-3 through 7-6. It is assumed that the multiple dry years are the same as the worst case Water Forum drier years in which the District's surface water supply is limited to 54,200 ac-ft, and that any shortfall is made up by Family Agency groundwater.

Table 7-3. Multiple Dry Year Water Supply and Demand Comparison, ac-ft/yr, Period Ending in 2010

	2006	2007	2008	2009	2010
SJWD surface supply	54,200	54,200	54,200	54,200	54,200
Family agency groundwater supply	8,422	8,878	9,335	9,791	10,247
Supply totals	62,622	63,078	63,535	63,991	64,447
Demand totals	62,622	63,078	63,535	63,991	64,447
Difference (supply minus demand)	0	0	0	0	0
Difference as a percent of supply	0	0	0	0	0
Difference as a percent of demand	0	0	0	0	0

Table 7-4. Multiple Dry Year Water Supply and Demand Comparison, ac-ft/yr, Period Ending in 2015

	2011	2012	2013	2014	2015
SJWD surface supply	54,200	54,200	54,200	54,200	54,200
Family agency groundwater supply	10,596	10,944	11,293	11,641	11,990
Supply totals	64,796	65,144	65,493	65,841	66,190
Demand totals	64,796	65,144	65,493	65,841	66,190
Difference (supply minus demand)	0	0	0	0	0
Difference as a percent of supply	0	0	0	0	0
Difference as a percent of demand	0	0	0	0	0

Table 7-5. Multiple Dry Year Water Supply and Demand Comparison, ac-ft/yr, Period Ending in 2020

	2016	2017	2018	2019	2020
SJWD surface supply	54,200	54,200	54,200	54,200	54,200
Family agency groundwater supply	12,171	12,351	12,532	12,712	12,893
Supply totals	66,371	66,551	66,732	66,912	67,093
Demand totals	66,371	66,551	66,732	66,912	67,093
Difference (supply minus demand)	0	0	0	0	0
Difference as a percent of supply	0	0	0	0	0
Difference as a percent of demand	0	0	0	0	0

Table 7-6. Multiple Dry Year Water Supply and Demand Comparison, ac-ft/yr, Period Ending in 2025

	2021	2022	2023	2024	2025
SJWD surface supply	54,200	54,200	54,200	54,200	54,200
Family agency groundwater supply	13,026	13,160	13,293	13,427	13,528
Supply totals	67,226	67,360	67,493	67,627	67,728
Demand totals	67,220	67,347	67,474	67,601	67,728
Difference (supply minus demand)	0	0	0	0	0
Difference as a percent of supply	0	0	0	0	0
Difference as a percent of demand	0	0	0	0	0

7.2 Water Shortage Expectations

Water shortages are projected when only considering the District's surface water supply. However, three of the District's wholesale customers (Fair Oaks Water Distsrict, Citrus Heights Water District, and Orange Vale Water Company), can rely on groundwater to meet any supply shortfalls. The District along with its Family agencies are signatories to the Water Forum Agreement. The Water Forum Agreement allows for groundwater to be used to meet short falls in surface water supply during dry and conference years. Groundwater supply shortages are not expected. With the formation of the Water Forum and SGA, and the implementation of conjunctive use practices, the groundwater supply is expected to be maintained. Therefore, there are no projected supply shortages projected through to 2025.

7.3 Water Shortage Contingency Plan

The Water Forum Agreement describes supply scenarios for normal, dry, and conference years. However, the Water Forum Agreement acknowledges that there may be years where surface water supply is less than even the stipulated decreased demands. The District may also experience short-term water shortages due to mechanical failures or other circumstances. For these instances, the District has developed a water shortage contingency plan. The complete plan is included in Appendix D. The District has also enacted a wasteful use of water law in its ordinances, which is excerpted in Appendix H. In addition, the District has the following resources in place to mitigate against the impact of catastrophic emergencies and inconvenience to its customers:

- An existing emergency response procedure for immediate action.
- Participation in a regional mutual aid agreement with the city of Sacramento and local agencies to increase recovery capabilities.
- Membership with "California Utilities Emergency Association" (CUEA) to augment the District's preparedness through comprehensive training, education and emergency planning.
- Membership with the Inland Region "Water Agency Response Network" (WARN) IV Mutual Aid Network to secure resources the geographic area if necessary.

- San Juan Water is an active member of the WARN IV steering committee created to expand the network and improve participation within Region IV.

7.3.1 Stages of Action

The District's water shortage contingency plan is based on five stages as defined in Table 7-7.

Table 7-7. Water Shortage Contingency Plan Stages

Stage	Water supply conditions	Percent shortage
Stage 1 – Normal Water Supply	Supplies available to meet all demands	0-5%
Stage 2 – Water Alert	Probability that supplies will not meet demands	6-10%
Stage 3 – Water Warning	Supplies will not be able to meet expected demands	11-25%
Stage 4 – Water Crisis	Supplies not meeting current demands	26-50%
Stage 5 – Water Emergency	Major failure of a supply, storage, or distribution system	50% and greater

7.3.2 Three-Year Minimum Water Supply

The three-year minimum water supply is presented in Chapter 4. Results are summarized below in Table 7-8.

Table 7-8. Estimated Minimum Water Supply, ac-ft/yr

Source	2006	2007	2008	Normal
USBR CVP	8,400	8,400	8,400	11,200
USBR CVP (Fazio Water)	9,750	9,750	9,750	13,000
PCWA	25,000	25,000	25,000	25,000
Pre-1914 Right	33,000	33,000	33,000	33,000
Total SJWD	76,150	76,150	76,150	82,200
Family Agency groundwater	Varies	Varies	Varies	Varies
Water Forum Restrictions	54,200 – 82,200	54,200 – 82,200	54,200 – 82,200	54,200 – 82,200

Note:
As sated in Chapter 4, any shortage in surface water supply will be met by groundwater supply from the Family Agencies

7.3.3 Catastrophic Supply Interruption Plan

The District has prepared a security vulnerability assessment and maintains an emergency response plan to address responding to catastrophic supply interruptions as well as other emergencies. The following Table 7-9 summarizes the responses to major catastrophes. A copy of the emergency response plan cover page is provided in Appendix G. The entire emergency response plan is not included in this document due to security reasons.

Table 7-9. Preparation Actions for a Catastrophe

Possible catastrophe	Summary of actions
Regional Power Outage	Command chain is defined that dispatches crews to operate generators and monitor operations. Criteria and procedures provided to return system to normal operation. A plan contains contact information for responsible parties and support services. Water shortage contingency plan stages will be implemented as required by the situation.
Earthquake	Command chain is defined that dispatches crews to inspect infrastructure and critical operations. Operations response crews assigned to monitor system operations and modify as necessary. Communication command chain is defined to coordinate with other local water agencies and emergency response officials as necessary. Criteria and procedures provided to return system to normal operation. A plan contains contact information for responsible parties and support services. Water shortage contingency plan stages will be implemented as required by the situation.

7.3.4 Prohibitions, Consumption Reduction Methods, and Penalties

Mandatory prohibition consumption reduction methods, and penalties in the District's water shortage contingency plan and wasteful use of water ordinance are presented in Appendices D and H respectively, and summarized below in Tables 7-10 through 7-12 to conform to the Plan guidelines.

Table 7-10. Mandatory Prohibitions

Prohibitions	Stage when prohibition is voluntarily requested	Stage when prohibition becomes mandatory
Street/sidewalk cleaning[a]	1	1
Washing cars		4
Watering lawns/landscapes		5
Uncorrected plumbing leaks	1	1
Gutter flooding	1	1
No refilling or filling of pools	1	4
No new connections		5

Note:

[a] except as necessary for health and sanitary purposes.

Table 7-11. Consumption Reduction Methods

Examples of consumption reduction methods	Stage when method takes effect	Projected reduction[a] (%)
Education Program	1	0-5%
Use prohibitions	1	0-5%
Demand reduction program	2	6-10%
Mandatory rationing	2	6-10%
Percentage reduction by customer type	2	6-10%
Limited landscape and pasture irrigation	2	6-10%
Irrigation allowed only during off-peak hours	2	6-10%
Restrict building permits (long-term only)	5	>50%
Restrict for only priority uses	5	>50%

Note:

[a] Brown and Caldwell estimate based on reduction goals of each stage.

Table 7-12. Penalties and Charges

Examples of Penalties and Charges	Stage when penalty takes effect
Penalties for not reducing consumption	2
Termination of service and reconnect fee	1
Continued and repeated water waste	1

7.3.5 Analysis of Revenue Impacts of Reduced Sales During Shortages

The following Tables 7-13 through 7-16 present the District's analysis of reduced revenues during water shortages.

Table 7-13. Actions and Conditions that Impact Revenues

Type	Anticipated revenue reduction
Reduced sales	None, rate structure reflects actual costs of production.

Table 7-14. Actions and Conditions that Impact Expenditures

Category	Anticipated cost
Increase staff cost	None anticipated.
Increased Operations and Maintenance cost	Costs may increase related to increasing groundwater use
Reduced sales	None, rate structure reflects actual costs of production

Table 7-15. Proposed Measures to Overcome Revenue Impacts

Name of measures	Summary of effects
Rate adjustment	Rates reflect actual costs of production.

Table 7-16. Proposed Measures to Overcome Expenditure Impacts

Name of measures	Summary of effects
Not applicable	Not needed, rates reflect costs of production.

7.3.6 Reduction Measuring Mechanisms

The following Table 7-17 summarizes District's procedure for monitoring its various water shortage mechanisms for effectiveness.

Table 7-17. Reduction Measuring Mechanisms

Mechanism for determining actual reduction	Type and quality of data expected
Treatment plant production volume	Daily production will be monitored from the plants production meters. Production meters are accurate within +/- 5 percent.
Customer records	With the District's new billing system, customer accounts can be grouped by type or by specific customers to monitor usage. Data will be evaluated depending on situation. Data is based on customer meters which are accurate within +/- 1 percent.

CHAPTER 8
REFERENCES

Black and Veatch. 2005. San Juan Water District – Draft Wholesale Master Plan, Phase II Historical and Projected Water Demand Level of Service. April 29.

California Department of Water Resources. 2005. Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan.

Carollo Engineers. 2001. Regional Wastewater Treatment Plan 2020 Master Plan. November.

EDAW/SWRI. 1999. Executive Summary of the Water Forum Proposal Final EIR. October.

Montgomery Watson, 2003, American River Basin Cooperating Agencies Regional Water Management Plan.

Nolte and Associates, Inc. 1994. Sacramento County Water Reclamation Study. August.

Sacramento Groundwater Authority. 2003. Groundwater Management Plan. December.

(need author). 2005. San Juan Water District – Draft Retail Master Plan Update June.